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ABSTRACT

Achievement testing indicates that the typical student who leaves high school prior to graduation has academic deficiencies considerably below expected grade placement. The need exists for identifying potential dropouts prior to their actual withdrawal. After a dropout-prone student has been identified, an analysis of his specific needs should be made. Finally, specifically tailored instructional programs based on needs should be implemented to allow the student to achieve academic and social growth. This paper describes such a program. A psychologist and psychometrist developed a battery of tests to help identify prospective dropouts, for whom a remediation program in basic mathematics was developed. Results indicate that the program was successful in encouraging students to stay in school. (Author/HMV)

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A PROGRAM TO IDENTIFY DROPOUT-PRONE STUDENTS, ASSESS THEIR NEEDS, AND TO DESIGN AN INDIVIDUALIZED INSTRUCTIONAL PROGRAM APPROPRIATE FOR MEETING SUCH NEEDS

Jerry L. Young

Achievement testing indicates that the typical student who leaves high school prior to graduation has academic deficiencies considerably below expected grade placement. In addition, he often exhibits behaviors that are viewed as negative and unacceptable by the school and community. The need exists for identifying the student as a potential dropout before the time arrives when he concludes that the values of being out of school outweigh the values of continuing a frustrating battle with academia. After a dropout-prone student has been identified, an analysis of his specific needs should be made since the data compiled in various studies for "typical" dropouts often fail to reflect individual variances. Finally, specifically tailored instructional programs based on needs should be implemented to allow the student to achieve academic and social growth in an environment that stimulates and nurtures his own interests.

The program described in this article was a part of a more extensive project funded through Title III, Elementary and Secondary Education Act and emphasized the development of diagnostic and prescriptive instruments. This project had as a long range objective, the reduction of recidivism among students in state training institutions as well as a decrease in dropout rates among students attending public schools.

During the summer and early fall of 1974, a team consisting of a psychologist and a psychometrist reviewed various tests and surveyed current literature related to the characteristics and means of preventing dropouts and/or delinquents. Information from this research was used to develop a battery of diagnostic and predictive tests that would identify certain behavior patterns and certain environmental/social strengths and weaknesses.

This battery was administered to a pool of approximately one hundred-fifty randomly chosen ninth- and tenth-grade students at a selected public high school. On the basis of test data, students were classified as having either a high or a low propensity for becoming dropouts. The classification scheme was structured so that a clear-cut dichotomy would exist between the two groups, i. e. there had to exist a rather large difference between the mean test scores for the two groups. As a result of omitting the borderline cases, the number of students in each of the groups was reduced considerably. After identification, some students moved away to other schools and some were unwilling to participate

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in a new teaching-learning situation. The number designated to participate was diminished even more when it was discovered that some students identified as potential dropouts were enrolled in college preparatory courses and were making satisfactory progress. To have placed these in a specialized program might have proved counter-productive. By the time the program was ready for implementation, time limitations made it impossible to administer the battery of predictive and diagnostic tests again in order to enlarge the pool with comparable students.

Students identified as dropout-prone were designated as the program target group and were randomly divided into the experimental (E) group and the control (C). Subjects in the two groups were similar with respect to race, age, and academic test scores.

In preparation for assessing student needs and for planning educational experiences that would be appropriate, a staff development program was organized. Through in-service meetings, teachers were familiarized with certain aspects of the teaching-learning process that would be consistent with the aims of an individualized program. Five curriculum development study groups were organized as follows: needs and interests of students, aims and goals, teaching methods and materials, utilization of time and space, and measurement and evaluation. Teachers in each group were given certain responsibilities in the development of the program.

Additional testing was necessary in order to determine student needs and interests in certain areas. A self-concept scale and an occupational interest inventory were administered. Each student was interviewed to acquire specific data related to school interests and personal goals. Standardized test scores in various academic fields were secured. This assessment revealed that most subjects were very weak in basic mathematical skills. Also, mathematics was indicated as a school subject disliked by most of the students. Poor attitudes toward self and/or toward other persons were indicated frequently.

A plan was developed to provide remediation in basic mathematics through the use of programmed learning packets. Part I of the "Success in Mathematics" series produced by Motivation Development Incorporated was selected for use. This series provides short units of material on topics ranging from simple place-value to elementary algebraic sentences. The program used diagnostic testing for placement of students, a pre-test and post-test for each packet, specific behavioral objectives, and suggestions for student projects.

Originally, plans called for the program to include from one to four or five students from the E group and an

approximately equal number from the C group to be assigned to each instructional class. Negative feelings expressed by some of the E subjects, since only one or two might be in a given class, convinced the researcher to enlarge the number of students to five using treatment materials in any given classroom. These additional students, referred by their respective mathematics teachers on the basis of low achievement in basic mathematics skills and/or inappropriate classroom behaviors, were designated as the experimental-referred (ER) group. They were selected to receive the same program treatment as the E group.

The mathematics program was implemented in the spring of 1975 in eight classes involving two teachers. Each class was provided with a student assistant to aid the teacher in prescribing learning activities, testing, and progress reporting. The participating students were not clustered together in the classrooms nor isolated in any way from those involved in the traditional classroom activities. The presentation of the content in small increments together with immediate feedback as each step was completed, proved to be very effective in motivating most of the participants.

Evaluation Procedure

After approximately seven weeks of field-testing, the mathematics program was evaluated as one means of reducing the probability of dropout-prone students quitting school. Basically, three approaches were used in the evaluation. These related to academic achievement in mathematics, behavioral patterns often associated with dropouts, and the degree of like or dislike for the program by the participants.

Academic progress was measured in two ways. A comparison was made among the E, C, and ER groups of pre- and post-test raw scores made by the three groups on the Wide Range Achievement Test (Level I). Another means used to measure academic achievement was a comparison among the three groups of six-weeks grades attained in mathematics. Grades achieved during the time the program was in operation were compared with the grades earned earlier in the semester.

Students in the C and E groups were compared for changes in behavior noted by the program teachers. This was accomplished by using a locally-prepared Student Evaluation Form which consisted of eight characteristics frequently associated with students who drop out of school. The teachers rated each student on each characteristic prior to the program's initiation and again at its conclusion.

Near the end of the end of the school year, E and ER students were asked to complete an unsigned survey form (Program Evaluation Form). This was designed to allow them to respond anonymously to questions regarding their opinions about the program.

Evaluation Results

Conclusions and inferences based on the statistical data presented in this article should be made with care. One reason for this is the small number of E and C subjects involved in the program (See Table 1).

TABLE 1

Student Data

Experimental N=13		Experimental-Referred N=26		Control N=13	
8 Black	9 Male	15 Black	14 Male	6 Black	12 Male
5 White	4 Female	11 White	12 Female	7 White	1 Female

Another reason to use caution in reviewing these data is the brief period of time alloted for the field-test. Implementation for an entire semester might have produced more conclusive results. It should be noted that one participant (experimental) did drop out of school during this time. However, the program could not have been considered ineffective in this case since the student's record revealed that she only completed the pre-test of the first assigned packet before leaving and thus was not a part of the treatment program. No student who had begun serious work in the program dropped out of school during the seven weeks of implementation.

In spite of limitations of time and the small number of subjects, certain observations about the program appear appropriate. Table 2 reveals pertinent facts concerning pre- and post-test scores on a general test in mathematics.

TABLE 2

Wide Range Achievement Test Data

Note--Highest possible score = 43.

Group	Mean		Median		Mode		Range		Std. Dev.	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Exper.	15.6	19.7	15.0	19.5	10	10/12	21	23	5.8	7.6
Exp.-Ref.	18.3	19.6	18.0	20.5	--	25	22	25	5.6	6.4
Control	18.3	19.7	17.0	16.0	--	15	26	26	6.8	6.8

As revealed in Table 2, the gain made in the mean raw score on the Wide Range Achievement Test by the E group (4.1 problems) was considerably higher than that attained by the controls (1.4 problems) even though mean post-scores for the two groups were the same. Oddly, the experimental students referred by their teachers showed the least gain of all (1.3 problems). Yet, the combined gain by all students involved in the alternative mathematics program was about twice as great as that made by those students using the traditional classroom approach to learning. Although not revealed in Table 2, no student in the E group made lower on the post-test than on the pre-test. This was not the case with the ER students (four made lower) and for the C group (three students scored lower).

Another means of measuring academic performance was to compare the six-weeks grades in mathematics received by students in the three groups during the time the program was operational with the grades which they made during the fourth and fifth six-weeks. In Table 3, grades for the last six-weeks (program period) are compared on the basis of being better than, the same as, or worse than those of the fourth six-weeks. In the same manner, Table 4 compares grades made during the last six-weeks with those of the fifth six-weeks. Pluses or minuses were disregarded when used in conjunction with grades.

TABLE 3

A Comparison of Six-Weeks Grades Made During the Last Six-Weeks With Those Made During the Fourth Six-Weeks

Experimental Group (N=13)			
	Better	Same	Worse
Percent of grades	76.9%	7.7%	15.4%
Experimental-Referred Group (N=26)			
	Better	Same	Worse
Percent of grades	73.1%	19.2%	7.7%
Control Group (N=13)			
	Better	Same	Worse
Percent of grades	15.4%	53.8%	30.8%

As shown in Table 3, the performance of the groups using the individualized approach to learning was superior when compared to that of the control group. Table 4 shows similar results involving grades for the fifth six-weeks.

TABLE 4

A Comparison of Six-Weeks Grades Made During the Last Six-Weeks With Those Made During the Fifth Six-Weeks

Experimental Group (N=13)

	Better	Same	Worse
Percent of grades	76.9%	15.4%	7.7%

Experimental-Referred Group (N=26)

	Better	Same	Worse
Percent of grades	80.8%	7.7%	11.5%

Control Group (N=13)

	Better	Same	Worse
Percent of grades	15.4%	46.1%	38.5%

Table 4 shows poor performance, comparatively, among students using the traditional learning program. Whereas from seventy to eighty percent of those using the alternative approach performed better that before (revealed by Tables 3 and 4), approximately the same percent of the control students did no better or did worse than before the program was initiated.

Changes in student behaviors often associated with school dropouts are revealed in Table 5 as these were noted by the program teachers and recorded on the Student Evaluation Form.

TABLE 5

Degree of Change in Student Behaviors as Indicated by Program Staff on the Student Evaluation Form

- indicates a behavioral problem
+ indicates no behavioral problem
Range of possible scores: -8 to +8

Group	Mean		Median		Mode		Range		Std. Dev.	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Exper.	-1.3	+.3	-1	-1	+2	-2	7	10	2.6	3.4
Control	-.2	+1.0	0	-1	-4	-2	14	12	4.5	3.8

As shown in Table 5, there was a greater increase in behavioral ratings received by the experimental students (1.6) than was received by the controls (1.2). The E subjects had a lower mean rating on the pre-SEF but made a greater gain from pre to post.

Perhaps more significant than any of these measures in view of the overall objective of the mathematics program, i. e. to provide one means of encouraging students to stay in school, were the responses made by the students themselves about the program. The results of an anonymous survey taken among the E and ER students are presented on the next two pages. The numbers indicated in the blanks are the number of responses per answer. The total number of responses was thirty-five.

PROGRAM EVALUATION FORM

(A copy of the form filled out by students)

The purpose of this survey is to find out what you think about the math program that you have been in this six-weeks. DO NOT sign your name. Your answers will not affect your grades in any way, so Please be truthful.

I. In general, I thought the math program was (check one):

12 Very Good 12 Good 9 Fair 1 Poor 1 Very Poor

II. The one thing I liked most about the math program was:

(See attached sheet).

III. The one thing I liked least about the math program was:

(See attached sheet).

IV. The program (has 33 , has not 2) (check one) helped me to feel better about myself as a person and my ability to succeed.

*V. I (do 33 , do not 1) (check one) think the program has helped me to learn better.

**VI. I (would 20 , would not 13) (check one) like to take part in a program like this next year.

* 1 (No response)
** 2 Don't know

Total N = 35

II. The one thing I liked most about the math program was:

Could move at my own speed 9
Way the problems were explained 7
Helped me learn more about math 4
Doing problems 3
Nothing 3
The grades 2
Learned to work with fractions 2
Could check up on what I already knew 1
Being able to do something 1
Getting through each book 1
Addition and subtraction 1
Multiplication and fractions 1

III. The one thing I liked least about the math program was:

Nothing 11
Having to take exams 3
The program 2
Some problems were too hard 2
Don't know 2
Short test 1
Some problems were too simple 1
Not having a second chance at pre-test 1
Multiplication and fractions 1
Not being able to do some problems as quickly as I should 1
Could not cheat 1
(No response) 9

The two preceeding pages offer evidence that the program generally was well-received. It should be noted, however, that only about sixty percent of the students surveyed indicated that they would like to participate in a similar program the following year.

Recommendations

Based on the results of this program, the following recommendations seem appropriate, especially if replication is considered:

(1) An individualized, programmed approach to teaching mathematics should be considered as one aspect of a dropout-prevention program if an assessment of student needs indicates poor academic performance and/or a considerable dislike for mathematics as a subject;

(2) Student assistants should be an integral part of such a program;

(3) A very large sample of students should be involved in the initial testing in order to provide for larger experimental and control groups; and

(4) The program should be functional for no less than one semester in order to provide for a more extensive and a more objective evaluation, especially in the affective areas of learning.